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FEBRUARY, 1854.

[THREEPENCE.]

WINTER AND WAR.

WINTER and War, two kindred demons, beset the path of the opening year. Each as violent, pitiless, and uncontrollable as the other, and both necessary evils that we have to meet and resist. The first inseparable from nature; the last, unfortunately, seems to be equally a part of human nature.

The presence of either of these terrible things makes us acquainted with an awful power—a power that laughs at all our little appliances of steam-engines and hydraulic presses, tubular bridges, and such-like clever conceits. Why, a drop of water just swept by the icy breath of old Winter will shiver the strongest cannon at Woolwich, and our noble river becomes stiff and paralyzed as if by magic, at his Gorgon glance; even the mighty ocean is subdued for the fantastic sports of this fearful Zero to make mountains of glistening adamant out of its yielding waves, that crush our great ships like bandboxes. In a more sluggish, but not less murderous mood, does he collect flake by flake of his feathery snow, and pile up his mountain avalanche to sweep away our pretty villages, and castles, and churches, like children's toys; burying its human victims by hecatombs. This desperate antagonism of Nature and man is never more decidedly shown than in such elemental rebellions as these. It is as though man in his advance towards the promised dominion in which he has such faith, was to be constantly reminded, and in his moments of fancied security, of the tremendous power he has to contend against and subdue; of the necessity for vigilant exercise of his skill and increase of his means, lest he should sink into the lassitude of self-satisfaction and finality.

Perhaps no great enterprise of its kind ever had to contend against greater difficulties from the elements than the Crystal Palace. Two summers with hurricanes and floods, and now a winter with such ice and snow as had not been seen for years. The garden ground all turned to stone and the water to glass; a thousand willing hands benumbed and crippled; trusty

heads and hearts damped by doubts, delays, and disappointments. However, the worst is passed, and all now look forward with confidence, made strong by trials, to the completion of the noble design;—to the glorious first of May.

But how like all these demonstrations of the wild and lawless spirit of Nature's forces are to those strifes of the social elements which from time to time burst out with such sickening devastation. Napoleon's wars of conquest and territory just beginning to be forgotten and recovered from, when the spark of revolution kindles in France again, and all civilized Europe burns with wild thoughts and fierce efforts of a portentous and irresistible strength that sweep over thrones like an avalanche. The last of the heroes just put to sleep in the pompous shroud of his eternal peace when the prophecy of the prisoner-autocrat of St. Helena begins to work, and the Cossack starts on his march to Europe, to measure his strength, against the new Napoleon. We want no picturing of future events while the unmitigated horrors of Sinope are fresh; what more savage and relentless can be conceived, except of the hurricane and the flood—what more heartless and insensate to the cry of help and pity, but the wind and the waves?

The sword, like the surgeon's knife, is the opprobrium of society. Fighting, like the hurricane, may sweep away the depressing atmosphere, the fixed air of dogmas, customs, and prejudices, and, like the winter, it may crumble and mellow the unyielding barren soil for the growth and fruits of the genial summer of peace and rational advancement; but we may safely take it as an axiom, that war is the enemy of civilization. The arts of peace grow with cultivation of the intellect and heart; they encourage refinement of thought and feeling, and accomplish the universal benefit and elevation of the race. There has been more advance in every department of knowledge, more practical application of science, and more good done in every direction during the last forty years, than ever was known since the times of Galileo and Bacon.

A forty years' peace works strange changes in

our hearts, and alters our views of things in general wonderfully; it creates friendships, good and true, with foreigners of every kith and colour—it has, we really believe, at last persuaded John Bull that Frenchmen are not the emaciated, hairy race, subsisting on frogs and vinegar, that the traditions of his family have told him of. It sweeps away mountains of bigotry and prejudices, and stifles whole volcanoes of enmities. When Victoria put on the crown, two sworn foes and rival champions of modern warfare met for the first time face to face on the turkey carpet of Apsley House. "I meet you at last," said the iron old Duke. "Yes," slyly replied the courtly Soult, "it has been my misfortune to have followed you so long and never to have met you till now."

In 1851, at the jubilee of art and industry, the ancient enemies of Cressy and Agincourt met on a field of cloth of gold worked by all nations. The Crystal Palace placed the seal upon their friendship, and now positively Jack and the Mounseer are going arm and arm to crush the great giant of autocracy. Enlightened Christendom goes to fight in the east again;—this time for the Crescent against the aggressions of the Cross.

The Crystal Palace, then, has great responsibilities and good responsibilities; it is evidence—and magnificent, spontaneous evidence—of the animus, the "inner life," of the great nation, and gives us faith in it as the great peacemaker of the age. Is it not a sign of the times, pregnant with a deep and fore-reaching meaning, when the two first nations of the world, the born enemies of ages, begin to build Crystal Palaces? to erect their thrones of art, science, and civilization, their court-circles, where pure and healthful enjoyment of the beauties of life and the blessings of cultivation, mutual indulgence, and happiness, shall be the rule.

In spite, then, of the ominous clouds rising in the East, there are fair grounds for hoping that the time is not far off when there will be no more war. A few more Crystal Palaces and a few more meetings like the Hyde Park gatherings, and men will avow their disgust and dread of war without fear of being thought cowards; they will utter their contempt for such folly and inhumanity without being accused of cant. Governments, too, will become more like the "conscrip fathers" of the grand family of the world, than the tools of this or that ancient and aristocratic centre of authority.



JOURNAL OF THE PALACE.

THE crowds of visitors so courteously invited by the Directors to see the progress of the wonders, during a fortnight, at Christmas time, reminded us of the old Exhibition. It is calculated there were, on several days, from 3,000 to 5,000 visitors in the Palace at a time. The general feeling was one of great astonishment—scarcely any one seems to have had an idea of the comprehensiveness of the scheme, or the many surpassingly beautiful things already to be seen there; and thousands experienced the delight of seeing such marvellous and beautiful works of art as they had no notion existed. So even now does the educating, the sweet teaching, begin. The colossal figures were a great source of wonder—how they ever got there, and what they were made of, whether they were cut out of stone, or what? The Modelling Court (every place is a 'court' here), was a great resort, with its groups of bearded Frenchmen and Italians, in all sorts of whimsical caps and blouses, some touching with dainty hand an exquisite figure or piece of ornament; others on scaffolds hammering and plastering away at the huge colossal Egyptian figure. In other parts, artists painting the ceilings, and singing German choruses, to the gratification of listening visitors—indeed, artists and workmen were engaged in all the courts, but the centre transept was still and noiseless as if (as one of the visitors said) the great contractors were so proud of their scaffolding—certainly very imposing—that they could not endure the thought of having it removed. The remarks of the different spectators would fill a volume. Two guardsmen, after strolling through the Palace to their heart's content, were waiting in the lobby for their phaeton, one suddenly struck the other in the ribs, and before he had any time to return the salutation, said, "Charles, no more dull day next winter, my boy—no more dying of *ennui* in those infernal barracks; we'll get into our trap, and bow roll to the Crystal Palace, and no mistake!"

The number of homeless and destitute dogs (quadrupeds) living upon society, had so increased in the Palace as to become a positive nuisance, when a murderous-looking placard was issued "by authority," ordering banishment or death to the poor canines. The well-known mutual regard which the *genus homo* and *canis* have for one another was painfully excited—a chord was touched, anxiety and terror came upon both. As, every now and then, a policeman appeared, dragging a captured cur in each hand, it was droll to see how the Englishmen all laughed, and joined in the cry of "Turn him out—he's got no friends!"—while the yelping seemed to be the signal for a sympathetic rush from the Frenchmen, whose looks betrayed their silent emotion. The fact was that these gentler souls had made a pet of a wretched little creature who was born and brought up inside the great plaster horse on which Guatemala sits so big and solemn, and they called him "Breakfast"—so, at every yelp of distress, the whole plaster of Paris brigade rushed out to rescue "Breakfast," just as they would to defend a barricade.

The advance of the Nineveh Court shows what a very striking object it will be in the nave. The immense human-headed bulls and lions cast from those of Botta, at Paris, and Layard, in our British Museum, and the great giant Nimrods that guard the portals, almost cover the walls—and over them are short columns, with the bull-headed capitals, supporting an immense projecting cornice, and forming the upper story, some fifty feet high. The appearance is surprisingly grand and imposing. In the Byzantine Court the beautiful fountain is being erected made of polished Dove marble.

We are glad to see the press take pleasure in giving descriptions of the various departments of

the Crystal Palace. The Pompeian House (Pompey's House, as the navvies have it), being the most finished, seems to be the favourite subject. The *Balder* has already given an able article about it, with a beautiful illustration; and the *Athenaeum* came out also with an article showing a finished and complete acquaintance with the subject. The following is admirably descriptive of the place:—

"The walls and ceilings are exquisitely painted, chiefly—as was natural in a place on the shores of the sea—with subjects drawn from the ocean or the mountain. We have no flood of life streaming along the walls, as in a Grecian frieze—no 'leaf-fringed legend,' as on an Etruscan vase—but in their stead, flying Cupids, dolphins, sea-bulls, tritons, and sea-centaurs, with paws branching into sea-weed. In the centre panel of a recess to the right of the entrance, there is a small painting of 'Perseus rescuing Andromeda,'—a favourite subject at Pompeii. The monster, 'a most delicate monster,' evidently a small species of shark, is at the maiden's feet. The background is well chosen, and with much successfully attempted atmosphere. In one compartment we see a slave bringing a seated bather a flesh-scraper. The style of decoration is light and summery, almost flimsy—rich blues, deep reds, and black, predominate as the grounds. In another room we have 'Venus fishing;' to a maiden (perhaps Dido), her lover's galley lying in the distance. Round this cornice, alive with azure birds, and geese, and peacocks, a train of Cupids hurry along with an untied garland that streams behind. Here are a group of winged Loves, carrying between them a wine-jar, shaped like a strawberry pottle—and here is a musical party of the brood of Venus, some seated on couches, and others applauding a girl who dances to the sound of a flute, keeping time with castanets. Here is the old man drawing a Cupid from a cage full of his rainbow-winged kinsmen, half-butterflies, half-seraphs; and here is Venus dithering a *biga*, or small car."

The Fine Arts Courts, both on Mr. Digby Wyatt's and Mr. Owen Jones's side are progressing rapidly, new beauties showing themselves every day. The painting of the domed ceiling of the Roman vestibules is a part that has just received the last touches from the pencils of the artists, and the scaffolding being now removed, courts the admiration it so well merits.

Some experiments have lately been tried in the heating apparatus of the Palace. It is a part of the arrangements with regard to which some anxiety has necessarily been felt, on account of the great magnitude of the scale upon which the plan was to be adopted, and the immense distance which the heated water would have to travel. We understand that a circuit of pipes of some few miles was set to work during the cold weather. The heated water travelled perfectly well through them, and raised the temperature four degrees, in spite of all the disadvantages of extreme frost, the open transept, and quantity of snow on the roof.

The two lofty towers of iron that flank each extremity of the Palace, and form such striking objects in every direction for miles round—the principal duty of which is to support the tanks for feeding Sir Joseph Paxton's magnificent fountains—have been decided to be, after mature deliberation, scarcely able to undertake their arduous task. Taking into consideration the immense weight they would have to carry at the top, and not being either stronger or broader at the base than at the summit; The treacherous nature of the soil causing, also, serious doubts and anxiety as to the perfect stability of all heavy structures bearing upon such a very small point of the surface. It has, therefore, been thought advisable, as we understand, to reconstruct them upon a broader base, and with stronger supports of iron for the first two-thirds of the height.

We subjoin a list of some of the visitors during the past month.

His Excellency Namith Pacha and two sons; Lord Downes, Rev. J. H. Gooch, Halifax, Robert Corckling, Manchester, Mr. Brown, Newcastle, Edward Moorhouse, Leeds, Captain T. Wilson, R.N., Captain O. J. Jones, R.N., Captain Hammurley, Sir George Hampson, Bart., Miss Hampson Rev. H. Leech, Lady James Strutt, Captain Hutchinson, Mrs. Hutchinson, Mr. C. Shearer, Thurso, Caithness, Rev. Alfred Daniel, Frome, Rev. T. Hotham, Rev. P. Maitland, R. Gosling, Esq., Leicester Penrhyn, Esq., Captain Thesiger, Mr. and Mrs. W. Hibbert, St. Helme's, Lancashire, John Riddell, Canada, John Thompson, Glasgow, Captain G. Strong, R.N., W. Bonna, Edinburgh, Rev. and Mrs. Gilbert Pearce, Sir E. N. Buxton, Rev. H. E. F. Garnsey, Mag. Col., Oxford, Rev. James Follitt, Rev. and Mrs. Clementson, Lord Arthur Hervey, James Shearman, Dorking, John Oaksports, Brighton, Peter Inebald, Stokes Hall, Rev. — Carter, Rev. G. H. Corke, Rev. W. Laing, Dr. Henry, Campbell town, Archdeacon McNair, Glasgow, Frederick W. Horton, R.N.R., Carleton, Dr. Edward Roberts, M.D., Erasmus Wilson, Esq., Mrs. Lucas, Rev. J. C. Wilks, Captain Rich, Captain A. Rich, Lady Hampson and two daughters, Rev. E. Rudge, Mrs. Bowman, Miss Berkeley, Miss Blake, Mrs. White, Mr. Matthew Sidney, A. Jee, New York, W. Longford, Petersburg, J. Kerschner, Madrid, Rev. H. Latham, Rev. W. G. Clark, Captain Hawkins, R.N., Miss Cooper, Rev. C. English, Mrs. English, T. Thompson, Caroline Amelia Butler, Philip Smith, Mill-hill, Mrs. Smith, Henry Laumann, LL.D., H. E. Harris, Brighton.

We are authorized to state, in the most positive terms, that the Crystal Palace will be opened to the public in May next. The rumours to the contrary lately prevalent, had no foundation in fact.

ZOOLOGICAL DEPARTMENT.

THE Bills of Mortality show what devastation the severe winter has made in the human species, yet few of us ever imagine that brutes feel the effects of the rigorous climate so fatally as it seems they do. The mild winters of late years have thrown everyone off his guard, and a sharp frost seems to have come upon us like a thief in the night, much to the dismay of our public and private menageries, as well as others; many of their largest and most valuable animals have succumbed under the inclement weather. Since Christmas Mr. Bartlett, the Taxidermist to the Crystal Palace Company, has had several fine specimens of various animals fall into his hands; among which may be enumerated a fine male elephant, the skeleton of which we saw hanging by a tree, the bones as red as if they had been painted vermillion, the skull lying on the ground, and the skin turned inside out a little farther off; the strangeness of the scene made us feel inclined to imagine that we were treading on the soil of India's far-off clime, instead of these incidents being performed before our eyes on British ground, a large male Giraffe, the American tapir, five Leopards, three fine antelopes, an Indian wild boar, and several other animals of smaller size. The skins of most of these are being prepared for the Crystal Palace Company to add to their already unrivalled collection. The skeletons of the larger species will be articulated for the various Museums of Comparative Anatomy.

PARLIAMENTARY PAPERS.—The Select Committee of the House of Commons, on the expediency of distributing Parliamentary papers among Mechanics' Institutes and other Literary Societies, have made a report strongly recommending that measure.

SALMON FISHING.—The artificial mode of propagating salmon from the ova was practised at Worcester three years ago, by Mr. Boccins. That gentleman lately paid the Severn a visit, in the hope of obtaining some fecundated spawn of its famous salmon for stocking the rivers of Australia, but was unsuccessful.

The fishermen have been tolerably successful in the take of salmon since the opening on the 1st inst.; and, as usual in this month, the salmon taken run very large, some exceeding 23 lbs.

Applied Science, Art-Manufacture, Machinery, and Commerce.

PHOTOGRAPHY.

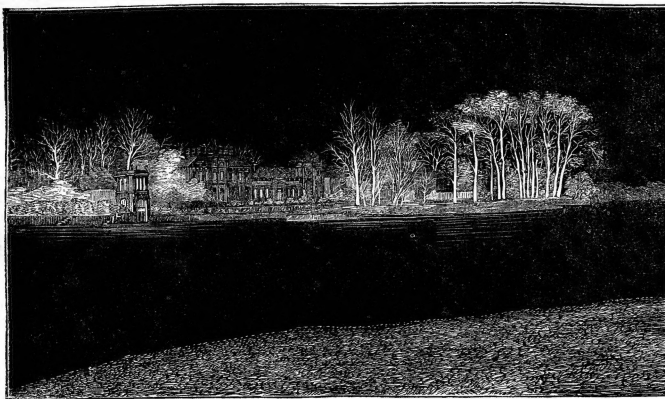
A lecture on Photography was delivered by George Grove, Esq., Secretary to the Crystal Palace Company, to the Sydenham Literary Society.

The lecturer commenced by reminding his hearers that his intention was not merely to amuse them for an hour, but to make them understand the principles on which the practice of the art of photography is

based, some of the main processes employed, and the chief difficulties encountered therein, in order that they might carry away knowledge which would enable them for the future to examine photographs with a greater appreciation of their real beauties, and of the merits of the artist who produced them.

The possession of a power of thus appreciating, generally, the construction or execution of things,

NEGATIVE (A).



sun himself is made to register and perpetuate the forms of things illuminated by his rays."

A drawing of an object is a representation, more or less faithful, according to the ability of the artist; while a photograph is, as far as light and shade go, a fac simile of the scene, minutely exact to a degree which no artist can approach, transferred from nature to the paper by the sun himself in about a minute of time.

But how is paper to be made capable of receiving such an impression?

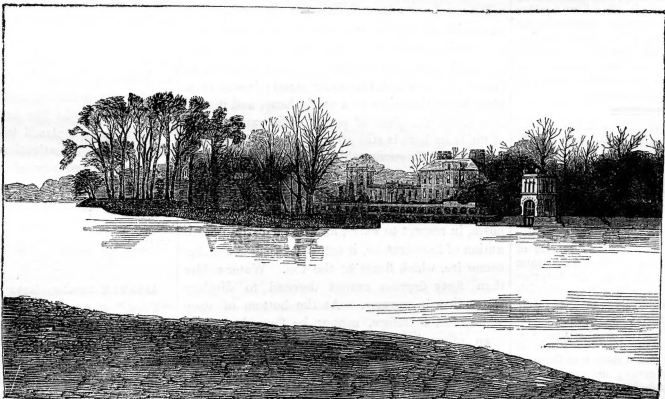
Nearly everyone has observed the curious power required, since in it a reduced fac-simile of the object or landscape is obtained in exact proportion of parts, and of light and shade. If, then, a piece of sensitive paper be laid upon the ground glass of the camera obscura, so as to come into contact with the image thrown thereon, it is clear that wherever light shines through the glass it will blacken the paper, while where no light comes through, the paper will remain white. Thus a white house would appear on the sensitive paper as a black house, and the dark windows and doors as light spots: a deep mass of shade would be white on the sensitive paper, the intermediate shades being similarly represented in their gradations. And thus a picture will be obtained exactly the same in form as the original picture in the camera, but as to shades absolutely in reverse, and this is called a negative picture. Some means must next be adopted for fixing the picture, or, in other words, for depriving the negative of its property of turning still blacker from light. If now we take our negative and put it over a second sheet of sensitive paper, and allow the sun to shine through it, all the dark spaces in the negative will intercept the light, allowing the paper below to remain white, and all white spaces will allow the rays to

pass and to create corresponding black spaces, and so the negative will be reversed again, and we shall have obtained a positive or natural picture with its light and shadows as in nature.

This is the whole principle of photography: but there are some points of detail which must still be noticed.

1. It is not light which discolours nitrate of silver: for if light be passed through a prism, so as to separate it into its component colours, and the spectrum be thrown upon a piece of sensitive paper in a dark place, no effect will take place where the lower part of the spectrum falls, nor as far up as the top of the yellow band; the discoloration commences with the green, is most powerful at the blue, and extends in the same direction far beyond the top of the spectrum: beyond, in fact, a place light exists. If, therefore, a sensitive paper be covered with a piece of light yellow glass, and exposed to the full sunlight, no discoloration will take place; while under a piece of deep blue glass the paper will blacken as readily as if it were

POSITIVE (B).



2. Besides the difficulties of manipulating the paper or plate through the various chemical operations—requiring for success long practice and natural knack—there are some causes of failure inure being taken upon a silver plate. By exposing the plate to the vapour of iodine, a film of iodine of silver, highly sensitive to light, is formed on the surface, while the picture is developed by putting it over heated mercury, the fume of which deposits itself on the parts

affected by the light, the dark surface of the untouched parts forming the shadows. Of course there is no printing, and the pictures are those originally impressed by the sun.

The stereoscope is one of the latest and most beau-

tiful applications of the art. Since most persons look at objects with both eyes at once, it will be obvious that if the view taken by each eye be analysed, it will be found a little different from the other; e.g., suppose the object to be a small box, placed within a few

was spoken of as a real benefit, and examples were given of its advantage in matters both of the eye and ear; and the lecturer expressed a hope that Crystal Palaces and Art Unions on the one hand, and Hullah's singing schools and Promenade Concerts on the other, were rapidly educating both the eyes and ears of the present generation.

"Photography," he said, "is the art whereby the property of lunar caustic and marking-ink, of turning black after a short exposure to light, though originally colourless. This is owing to their containing nitrate of silver; and paper saturated with this substance has of course the same property. Thus the first step is taken: a paper is got which the sun can affect. This is called "sensitive paper."

But some means must be got of concentrating on the paper a reduced image of the object, without which it will only turn black all over. This is got by means of the camera obscura, which has the precise

uncovered. So, too, in tropical latitudes, where the light contains more yellow, photographs take longer to produce. The active agent in photography, then, is not light, but is a certain property called by philosophers actinism.

2. In practice, the sensitive paper is not left in the camera until the image is fully impressed; but it is found that a few seconds are sufficient so to impress an invisible image on the paper that it can afterwards be developed by certain chemical agents.

An experiment of Mr. Talbot's, of the Royal Institution, in 1851, showed that the inconceivably short space of time occupied by an electric spark was enough fully to impress an image of a very minute object on a paper prepared by him.

3. The image, after being developed, is fixed by soaking the paper in a solution of soda, which combines with nitrate of soda, and brings back the paper to its original state.

The Difficulties of photography are very great.

1. The negative (A), as already said, is changed into a positive or print (B) by allowing the sun to shine through the former on to the latter, and, therefore, the sharpness and clearness of the positive will entirely

herent in the camera. Owing to the image being formed on a flat surface, however perfect it may be in the middle, there is always more or less aberration at the sides, while if the instrument be tilted up so as to command the whole height of a near object, the vertical lines will slant inwards at the top of the picture in a very painful way. Instances of these and similar faults only are cured by great experience in the operation, were shown by the lecturer.

This process is called the Talbotype (from its inventor) or Calotype. The Daguerreotype differs from it in the pic-

ture being taken upon a silver plate. By exposing the plate to the vapour of iodine, a film of iodine of silver, highly sensitive to light, is formed on the surface, while the picture is developed by putting it over heated mercury, the fume of which deposits itself on the parts

inches of the face, and right in front, the right eye will see a little of the right side, and the left eye a little of the left, in addition to the parts which are in common. This, however, is done unconsciously, the two different views combining with one, which conveys the idea of a solid figure. It occurred to Professor Wheatstone, that if two such views of an object were drawn, and placed side by side, and looked at at once, the converse of the usual process would take place, and the mind be deluded into the belief that a solid figure was before it; and this is a fact, and it will accordingly be found, on examining the stereoscopic pictures, that they differ slightly in the angle at which they have been taken.

The last process described was that by which the meteorological instruments at Greenwich are made to register their own motions by photography, a process of the greatest beauty and simplicity, but not to be made intelligible without the aid of diagrams and of a lengthened description.

The lecturer then gave a sketch of the history of the art, from the *horn silver* (nitrate of silver) of the alchemists, and the unsuccessful experiments of Davy and Wedgwood in 1802, to the perfected inventions of Daguerre and Niepce in France, and of Talbot in England, both of which were published in 1839 within a few months of one another. M. Daguerre's secret was bought for the public by the French Government, and a pension given to him and to M. Niepce, his coadjutor, but Mr. Talbot patented his process, and held his patent right until a few months back, to the great annoyance of photographers and a serious hindrance of the art, and the lecture closed by a statement of some of the evils which had resulted from this, and by the expression of a strong wish that a similar course had been taken by the Government of England like that of the Government of France.

The lecture was very fully illustrated throughout; there were glass and paper negatives and positives; specimens of errors, and distortions of various kinds; some of the lately-attempted magnified portraits of Mr. Wenham; photographic reproductions from Greenwich lent by Mr. Glaisher; and some photographic views in the Pyrenees, and elsewhere, lately taken by Martens, Delamotte, &c. Amongst these last were some of a series of views taken weekly at the Crystal Palace, and which, when the building is complete, will remain as a most interesting record of progress.

STITCHING MACHINE.—The first attempt at a machine for sewing was made in 1846 by Mr. Ellis How, of Boston, U. S. It proved an utter failure. Our countryman, Mr. C. T. Jenkins, has now invented a machine which he showed to the Society of Arts on the 18th ult. It makes 500 stitches in a minute, of any length or depth, and either straight, angular, or circular; it requires two persons to work it—one a boy or girl. The machine answers perfectly, so that we may hope to hear of no more starving sempstresses; such wretched mechanical and ill-paid labour will be done, as it should be, by iron hands.

PAPER AND RAGS.—It appears to be a well-ascertained fact that the materials for the manufacture of paper are becoming too scanty for the demand. Instead of relying on supplies of cast-off linen, &c., we shall soon be driven to the vegetable kingdom. It is a comfort to know that almost every vegetable tissue will supply fibre, and we have already learned a lesson from the Chinese in applying such material to the manufacture of paper—straw-paper being now quite admitted into use. Similarly, the Manchester men should remember that there is other fibre besides that of hemp and flax; there is other down besides that of cotton. An enterprising spirit might possibly spin a large fortune out of the fibres of a common nettle, or twist golden cords from the tissues of the bark of the beech. Toughness and elasticity exist in countless varieties of vegetable integument.

SCULPTURED SLAB FROM KHURSAABAD.—Mr. Sharpe exhibited at the Syro-Egyptian meeting, January 10, a drawing of a sculptured slab from Khurisaabad, published by M. Botta and Mr. Bonomi. It represents a fleet of Phœnician timber ships carrying planks of wood from a city on the coast. The timber is brought down to the coast from a hill. The Assyrian winged bull accompanies the ships, and the fish-god of the Philistines is on one side. Mr. Sharpe's conjecture was that these were ships of Tarsus in the service of Sennacherib, carrying the timber of Mount Lebanon from the city of Tyre, to be used by the Assyrian army at the siege of Pelusium, where Sennacherib's army was destroyed. The second book of Kings does not mention the siege of Pelusium as the spot where that celebrated event took place; that information is added by Herodotus. Again, neither the Book of Kings nor Herodotus tells us that a fleet was seen in attendance on Sennacherib's army; but the circumstances of the case make it probable, and in the forty-eighth Psalm, where thanks are returned for the city of Jerusalem not being besieged by the Assyrians, we are also told that the Lord scattered the ships of Tarsus by an east wind. The three writings, namely, the second Book of Kings, c. xviii. and c. xix. Herodotus, and Psalm xlviii, make it probable that Sennacherib had at that time a fleet of Phœnician vessels on the Mediterranean Sea, and this sculpture seems to be the representation of that fleet.

Science.

LECTURE ON FIRE.

By J. SCOTT RUSSELL, Esq.

EVERYTHING that animates, invigorates, and beautifies Nature is attributable to the beneficial agency of heat, yet the cause of heat is unknown; nothing has yet been elicited but that God willed it, and "it was so."

The ancients knew of the heat from the sun and from other bodies, but they were ignorant of heat under the earth's surface; now, we anticipate, should coal become exhausted, that heat would be obtained by boring more deeply than is customary at present, and by this means get our hot water at once from the depths of the earth, merely by turning the tap from our private dwellings, the volcanoes of every region being only chimneys or vents for the subterranean fires. Bodies when heated increase in bulk, which has its conveniences and inconveniences; it is convenient to the smith, who puts the tire round the wheel when red hot, and then cools it quickly by throwing cold water over it, which contracts it and renders it firmer and stronger than by any other method; it is inconvenient when we want a measure to be always of one definite length, neither expanding or contracting; and to clockmakers, their pendulums being longer in summer, causing the clock to go too slow, and in winter too fast, because shortened; but this is now remedied by the compensation pendulum. Heat has apparently no weight; although we have balances that will give the variation of the millionth part of a grain, yet they will not weigh heat.

An experiment was shown with a brass cylinder, which, when cool, fits into a notch lengthways, and also into a hole, but which by heating increased so, that, it neither will pass into the notch or through the hole. A bar of steel on one side and brass on the other was then heated and applied at the edges to a glass rod, and it was seen to be bent about a quarter of an inch, which was owing to the brass expanding more than the steel, which resisted it, thus causing the curve. This property of heat rather alarmed the philosophers, lest in a continued railway line of hundreds of miles it would in summer expand a mile beyond the station, and in winter not reach the station within a mile; but this is prevented by each piece of rail having room to allow for expansion.

The cracking of glasses, when hot water is poured into them, is caused by the difference in the expansion of the inner surface and the outer. Sometimes the stopper of a lady's scent bottle will not come out; the cold has contracted the neck of the bottle, but holding it over a little warm water will soon loosen it, as it expands the neck. The expansion of liquids was shown by a long glass tube with a bulb to it; this bulb was filled with coloured water, and a piece of paper attached to the height at which the water stood; it was then placed over the flame of a spirit lamp, and it soon rose above the piece of paper. The expansibility of fluids by heat is still greater than that of solids, and the differences which they exhibit among themselves are more striking.

God, who enacts laws, has caused a contrary principle of action, resulting for the wisest of purposes, in respect to water, for after a certain diminution of temperature, it actually expands and becomes ice, which floats at the top. Water colder than forty degrees cannot descend to displace water that is warmer. At the bottom of deep water, ice, therefore, cannot be formed; had it been otherwise, the lower parts of the water would be first frozen, and, when congealed, scarcely any heat applied at the surface could melt the mass; if this had prevailed in our lakes and seas, the change would be awful to contemplate.

Heat is produced when a substance is compressed; the temperature is increased, and heat may be said to be squeezed out. The horse-shoe striking against a flint is an example. A black-

smith—who, with regard to heat, knows a thing or two—is aware that when he hammers a piece of cold iron on his anvil, it soon becomes hot. If a barrel, or gun glass tube closed at one end, be taken, and a ram rod or solid piston be forced down it, the enclosed air will be compressed, and give out heat sufficient to light a piece of tinder fixed to the bottom of the piston.

Heat flies off in rays like light, losing portions of it by projections, in right lines into space, from all parts of a given surface. This has been demonstrated by separating the light from the heat of the sun, they being two distinct properties. If two vessels are placed a distance apart, one at the temperature of 50 degrees, the other 0 degrees, after a time, by the law of radiation of heat, both vessels will attain the same temperature, about 25 degrees. By adding wires to conduct the heat, the equality will be sooner accomplished. The law by which this is performed is unknown.

Heat is communicated from one body to another in two ways, called radiation and conduction, which last occurs from contact. The metals are all good conductors, but the coverings of animals, as wool, hair, and feathers, are bad conductors. Hence, the great use of even small portions of such substances in preventing the heat of animals from being carried off. This is shown by covering up ice in a blanket or eider down.

How many ways can this fact be applied to our advantage! At Paris, some time since, when a person wanted a hot bath, he was told to try the heat by putting his hand in, which he did, and was satisfied, but when he had undressed and jumped into the bath, his feet were frozen with the cold; there was only warm water at top, cold at the bottom. Now, they should have put the warm water at the bottom, and the cold at the top; the specific gravity of the hot water being lighter, would arise and blend with the cold, thereby increasing the temperature.

Our houses will never be properly warmed until we pursue a different course. The cold current of air down the fireless chimney being attracted by the heated one, the plan that ought to be pursued is to have a stove at the bottom of the dwelling, and an aperture at the window opposite the stove; the cold air would then be attracted to the stove, become warmer, and mixing with the heated air, raise every room in the house to a medium temperature. In the "Arabian Nights," there is a story of a person drawing the cork of a bottle, and a genie coming out of it. After a little trouble he coaxed him to get into the bottle again, which, when he did, he corked him up to prevent his escape a second time. So our detective philosopher, Farraday, drove the gas called carbonic acid up into a corner, and bottled him up. This gas is an unseen deadly poison, that floats on the surface of wells, pits, brewery vats, and the Grotto del Cano. Under pressure, and at a low temperature, it is now reduced into a liquid, is made to freeze by the cold produced by suddenly removing the pressure, causing evaporation, and in this state it looks like snow.

Each subject placed before you requires much thought and investigation, but if this brief outline has incited any of you with the desire to pursue this interesting and useful subject, the object of the lecture has been obtained.

YOUR COMPANY IS REQUESTED IN THE IGUANODON.

GENTLE reader, have you the nerve to put "Time" on one side and follow the osteo-necromancer Owen, to the Ultima Thule of creation—to stand with him in his magic circle of skulls and marrow-bones, while he calls up the huge reptile hulks, dead and buried before Adam was born—to accept his terrible invitation to meet a few select believers in his occult ontology, at dinner, inside the head of an awful lizard? No, you have not the courage; besides, you have an affection for turtles, and, seriously, you don't want to have the easy current of your thoughts disturbed, and you'd rather not have your mind unsettled

about any old traditions;—*eh, bien!* But you, must move on; no compulsion, only you must; and you must go to school at the Crystal Palace, and learn something of what they call “the development theory.” Learn how the solid earth was once a cloud, how it grew thicker, found a nucleus, and borrowed heat and light from the sun, and set up in business on its own account; at first growing small crops of lichens and mosses, then getting into the fern trade, and gradually doing an extensive business in the greengrocery line, until these tremendous slugs and reptiles came, and would soon have cleared off everything and left poor “mater tellus” bare as a primitive rock again. But things were on the move, the vegetables grew out of the reach of these terrific munchers, and they themselves felt their tadpole propensities fading, and, with vague feelings for promotion, retired to the solitudes of the waters, to meditate, like good saurians as they were, upon the delights of the next brevet and the pleasures in store for the fishes they hoped to be. “We have been fishes, and we shall be crows,” says the witty Coningsby, backed by the mysterious author of the “Vestiges.”

How strangely extremes meet; here, on the very spot where the dull creature crawled about, and after there's no telling how many thousands of years of development, there live animals with brains that enable them to prophesy backwards. They can tell you all the strange forms that have been living, and wasting away, and dying out since the world began; and a collection of men, with such brains, celebrate their triumphs—a paleontological orgy—in the body and brain-case of one of the extinct monsters. “A card, surrounded by grotesque and monstrous illustrations, was sent to twenty-seven gentlemen. Mr. B. W. Hawkins requests the honour of your company at dinner in the Iguanodon.” They met; Professor Owen represented the brains, and while doing the customary honours of our tables, administered a startling relish by describing some of these creatures that were half a crocodile, half a fish, half a dolphin and had the graceful neck of a swan. The freaks of the bigwigs of antediluvium went off with a droll mixture of mirth and solemnity. After short eulogies to Cuvier, John Hunter, Dean Conybeare, and poor Buckland, who from a single tooth constructed the Megalosaurus, the honoured list of names was closed end sealed by that of Algernon Mantell, the discoverer of the beast in the model of which the company had just dined. The memory of Mantell would ever be associated with that noble disregard of self with which he pursued his favourite study, and that porcupine-like jealousy which he always displayed lest any person should sacrilegiously dare to cut an inch of the tail of the monster which he had constructed from a single fossil tooth. Professor Owen, at the close of his remarks, proposed “The memory of Mantell, the discoverer of the Iguanodon,” a toast which was responded to in mournful and appropriate silence.

FOOTSTEPS OF CREATION.

There are many species of shell-fish, not one of which is now found in existing creation; and in the upper beds called the Upper Ludlow, we first see that creature of that great order of the animal kingdom called fishes. These, however, appear to have been small, although highly organized. The immensity of this deposit of the old red sandstone rests above the Silurian, and its history is like a fairy tale; the extraordinary forms of fishes that frequented the depths of its seas, the appearance of the first reptile, the evidence of the storm and the tempest, the appearing of its beds for thousands of feet together; but the carboniferous or coal deposit succeeds the old sandstone, and is of immense thickness; this period possessed a luxuriant vegetation of ferns, palms, and other plants, the remarkable part of which is, that all the plants found in the coal could only have existed in a tropical climate. Strange, too, does it appear that coal fossil plants, identical with those of the coal-fields of England, are now found in the Arctic regions; reptiles and shark-like fishes, insects and trilobites existed during the coal period. On these beds a formation, now called Peruvian, rests, and these Peruvian stratifications are very remarkable, as after the epoch they represent passed away, all the ancient or Palaeozoic fauna of animal life passed away also. The Peruvian beds contain some of these old creations, and many new ones. In the new red sandstone, animal life

appears to be altogether on a new type; for instance, all the shells, reptiles, and fishes are of entirely new genera and species—the change in the fish is most remarkable. Up to the deposition of the magnesian limestone, one of the beds of the Peruvian series, we find that the fishes possessed a one-sided tail, in which the back-bone was prolonged into the upper lobe; but with that epoch this peculiarity ended, for in the new bed system which succeeds, fishes with the tails of the common varieties took the place of the stranger and more ancient forms of the Palaeozoic ages. It is just at this period, too, that geologists have ascertained the Malverns were elevated into their present position. All the vast accumulations of the older rocks, Llandelo flags, Cardol beds, the Upper Silurian, old red sandstone, and coal formation, were, without doubt, accumulated above the hardened and massive syenite; but earthquake movements began, the massive accumulation of myriads of ages were torn up, dislocated, and wrenched back by the upheaving of that very mountain that now forms so beautiful and picturesque an addition to our native scenery. You ask the proof of the exact period of the upheaval of the range. Examine the new red sandstone beds on the east side of the hills—they are nearly horizontal, and therefore could not have been laid down when Malvern was upraised; while certain Peruvian beds are all torn up and rest at high angles against the syenite of the hills. So it requires only a little observation to be enabled to fix the period of the Malvern upthrow. The lias succeeds and rests upon the new red sandstone in the vale of Tewkesbury. The Lias and Oolitic system has been called the age of reptiles, from the multitudes of these animals that, during the period of the deposition of those beds, inhabited the earth and land of this planet's surface.

The lias formation in England does not appear to have been much disturbed by volcanic agency, but in India it has been upheaved to the height of 19,000 feet; and you may gather the same species of ammonites on the heights of the Himalaya that you do in the neighbourhood of Tewkesbury. The Oolite, a very extensive formation, rests on the lias, and the chalk again on this.—*Professor Buckman's Lecture at Malvern.*

ARE THE STARS INHABITED?

The distance of the moon is about 240,000 miles; the telescope would place us at 240 miles from it. Could we, at the distance of 240 miles, distinctly, or even indistinctly, see a man, a horse, an elephant, or any other natural object? Could we discern any artificial structure? Assuredly not. But take the case of one of the planets. When Mars is nearest to the earth, its distance is about 50,000,000 of miles. Such a telescope would place us at a distance of 50,000 miles from it. What object could we expect to see at 50,000 miles' distance?

If the discoveries of science disclose to us in each planet, which, like our own, rolls in regulated periods round the sun, provisions in all respects similar—if they are proved to be similarly built, ventilated, warmed, illuminated, and furnished—supplied with the same alternations of light and darkness by the same expedient—with the same pleasant succession of seasons, the same diversity of climates, the same general distribution of land and water, and we could doubt that such structures have been provided as the abodes of beings in all respects resembling ourselves?

If we had a fire in our neighbourhood which at once supplied light and heat, and that circumstances obliged us continually to shift our position in relation to it, how should we move so as to receive a uniform degree of illumination and warmth from it? Could we move in any other place than that of a circle around the fire, a centre, keeping thereby always at the same distance from it? Now this is exactly the path in which the earth moves; and we find that the three other planets severally also move in circles, each keeping continually at the same distance from the common fountain of light and heat.

Many examples may be given of this correspondence between the time of rotation of the earth upon its axis and the periodical functions of the organized world. Lianues proposed the use of what he termed a *floral clock*, which was to consist of plants which opened and closed their blossoms at particular hours of the day. Thus, the day-lily opens at five in the morning, the columbin dandelion at six, the hawk-weed at seven, the marigold at nine, and so on; the closing of the blossoms marking corresponding hours in the afternoon. Nor can this be regarded as a specific effect of light upon the plants, for when the flowers are introduced into a glass chamber that they stand upon and close their blossoms at the same time.

The necessity of maintaining a correspondence between the intervals of activity and repose, the taking of food, &c., and the period of light and darkness, was shown in the case of voyages made to the north pole, where navigators attained those latitudes in which the sun never rises for several weeks, in which cases it was found necessary to make the crews of the ships adhere to the habit of retiring at nine o'clock, and rising at a quarter before six. Under these circumstances they enjoyed a state of salubrity very remarkable, notwithstanding the trying severity of climate to which they were exposed.—*Lardner's Museum*, No. 1.

THE PAINTED DOME OF ST. PAUL'S.—The dome painted by Thornhill a few years before his death is being restored, or rather repainted, by Paris, for 20 feet of the picture is destroyed by damp; the rest is invisible from smoke and dirt; and having been done in boiled oil, had turned black. Mr. Paris has completely finished one of the compartments, taking the engraving as his model, the medium used is of his own invention; it will never change, and is washable.

Literature.

The Stones of Venice. Vol. 2: The Sea Stories

By JOHN RUSKIN. With Illustrations, drawn by the Author. Smith, Elder, and Co.

A PROPHET has come among the architects, and “Gothic” is his cry. He comes from the sea-girt resting place of the precious relics of Byzantium, and there is the shrine at which he worships his “throne of Venice,”—in this wilderness of bastard styles—in the modern Athens, is the voice heard—leave ye the lifeless temples of the Greeks, and enter the painted domes of living and speaking beauty of the City of the Sea. Faithfully, and with almost fanatic zeal, has he pored over the testament of his faith; studying the sculptured stones in every nook and corner, and interpreting a subtle and unsuspected meaning in the work of heads and hands now mingled with the dust of some thousand years ago. Often have we heard the Venetians wonder what the mysterious Englishmen could find in their old palaces; day after day, under the scorching sun, or in the cold rain, was the solitary to be seen in his sombre gondola, sketch-book in hand, before some archway or column, reading and marking with affection passages in his favourite stones unseen and hidden to the vulgar eye; every day at the same hour, as the sun came round and lit up his chosen capitals and cornices, you would see him arrive, stealthily and solemnly, speaking to no one, but waving only a sign to his gondolier, when he was about to begin his labour of love. But why must the student of Gothic make a pilgrimage to Venice?

Mr. Ruskin's wonderfully picturesque style of writing is not always clear, he is fond of giving to very ordinary words a meaning very different from the commonly-accepted ones; of bestowing fanciful titles on every-day facts, of trying to elevate good honest prose into bad poetry, by investing it with quaint conceits. For instance, when he speaks of the “throne” of Venice, few would imagine that he meant its mud. In vivid description he is unrivalled—if he has to picture some obscure corner of his beloved Venice, no matter how humble, he will set it before you, a word-picture, lifelike to the minutest detail, and so skillful is the touch, so concealed the art, that we feel there is not a single one of his gorgeous similes, which does not illustrate what he is describing, or one eloquent passage put in for the mere sake of fine writing. We doubt if finer pieces of this kind of writing could be found in our language than those in the second volume, in which he draws a parallel between the English Cathedral and the Italian Duomo. The noisy “Calle,” between the Campo San Moise and the Piazza San Marco, the Piazza itself, the listless frequenters of the Café Florian the Austrian band, the time-honoured flock of pigeons, the idle, wicked children basking in the sun, and, above all, the Duomo itself, are touched with a master pencil. The description of the now desolate isle of Torcello will also be remembered. Although possessing this marvellous facility of describing facts, Mr. Ruskin is not so lucid when from these facts he endeavours to deduce principles of design, of illustration, or of moral conduct, for in his view there is not a stone of Venice worth examining which does not preach something about all three. In one so sympathetic and imaginative, this deficiency is not unnatural. Ardent and enthusiastic, he thinks rapidly, and springs to his conclusion; he then lays before us both the object and the conclusion; but entirely forgets to tell us the how and the why, and probably would find it extremely difficult to do so. Had Mr. Ruskin been a writer of fables, he would have told us how a crow sat on a tree; every branch, every leaf on the tree, every feather on the crow's back would be painted; then he would tell of a hungry fox at the foot of the tree, and, perhaps, surpass himself in eloquence upon Reynard's brush; and finish by relating how the crow dropped the cheese and the fox ran away with it. Then rushing on to the moral, and making us

tremble by his fierce whirl of denunciation against the evils of vanity; all this time forgetting that he has never told us how the fox ministered to the crow's vanity by inducing her to sing, and thus puzzling his readers to find out the connexion between the fox, the crow, and the eloquent moral. And this is how he relates everything, an admirable describer, but an indifferent reasoner, he too often substitutes assertion for proof, and dogmatism for argument.

There is throughout Mr. Ruskin's writing a kind of morbid melancholy, which would be either pitiful or ridiculous, were it not counteracted in every page by earnest sentiments of the noblest philanthropy. His bitter reproaches of the modern Venetians, and his palliation of the conduct of their Austrian oppressors, we prefer to attribute to ignorance of the world; as in this from the Appendix, "I never once was able to ascertain from any liberal Italian that he had a single definite ground of complaint against the Government." Side by side with this passage let us place some of Mr. Ruskin's denunciations of the Venetians, and in most instances we may easily trace the cause of their degradation to Austrian rulers.

Those elements which in other countries make an acute thinker, an industrious worker, a good Christian, have in Venice no existence. In all countries where the higher classes have no political existence, or any possibility of attaining it, we always find the nobles passing their days in luxurious ease or useless trifling. These are the class of men forming the crowd of Café idlers, who through the piazzas of St. Mark. Does a man wish to travel, he cannot set his foot on the main land without the permission of the police; and if, as is probable, his opinions are known to be hostile to Austria the permission is refused. In every public haunt, and sometimes in private ones, a spy is set by the conqueror of his country to note every word the Venetian utters. In St. Mark's itself, we have heard the priest, whose duty it was to dwell on "Charity, faith, and hope" to all men, utter Sunday after Sunday nothing but fulsome panegyrics on the present rulers, and bitter anathemas on all so-called Reformers. So, it is no wonder that the Venetians should leave religion to the care of their rulers, and the lower classes should become utterly demoralized, and that the "non bestemine più" that Mr. Ruskin saw on the walls of Murano should be utterly unregarded. Is it to be wondered that the Cathedral of St. Mark should no longer have any interest for the people in general? Let it be well remembered, too, that one of the first acts of the Austrians on regaining possession of Venice was to re-establish the lotteries which the Italians had put down.

Let us now turn to the volumes themselves. The first volume, after a glowing description of the history and early origin of Venice, proceeds to the description of various architectural details: in fact a text-book for future inquiry. In the final chapter of the volume, under the title of "The Vestibule" (a truly characteristic appellation), he leads the reader to Venice; and here at the very outset we find an instance of our author's antipathy to the modern world, particularly modern Venice. He takes a gondola at Mestre, and comes, as in the days of Rogers,

venting his displeasure as he passes at that new marvel of Venice, the transmarine railway, on which he obstinately refuses to travel, and in which his singularly-constituted mind can see no poetry at all.

Before coming to treat on the Architecture of Venice, he proceeds to the neighbouring isle of Porcello, and here, amongst a variety of valuable writing on this interesting Cathedral, we find the same disposition to attach a sentiment to every curve and form.

Of the fact of individual mind being shewn in the thing worked upon in all good architecture we cannot doubt, and of the value of the knowledge gained in the attempt to discover it, but we must doubt the soundness of his view,

"Like to a fairy city steering in,"

on this subject. Could he have sketched out so fluently and so well the circumstances, the feelings, even the very thoughts, that actuated the builders of this church of Torcello, merely from its architecture? The effect of previous knowledge cannot be overlooked. We cannot believe that the impression on the mind of the beholder is a safe clue to the animus of the builder, various feelings being produced by the same object, under different circumstances. The practical lessons gained are immensely valuable to the student in art, but as historical evidences of thought possess only an imaginary value. After touching at Murano he returns to Venice, and takes for his approach to St. Mark's, that by the Campo San Moisè. Having advanced as far as "the well-ordered arches" of the New Palace, we have the following beautiful description of the façade of St. Mark:—

"Beyond those troops of ordered arches there rises a vision out of the earth, and all the great squares seem to have opened from it in a kind of awe, that we may see it far away—a multitude of pillars and white domes, clustered into a long low pyramid of coloured light; a treasure-heap, it seems, partly of gold, and partly of opal and mother-of-pearl, hollowed beneath into five great vaulted porches, celled with fair mosaic, and beset with sculpture of alabaster, clear as amber and delicate as ivory—sculpture, fantastic and involved, of palm leaves and lilies, and grapes and pomegranates, and birds clinging and fluttering among the branches, all twined together into an endless network of buds and plumes; and, in the midst of it the solemn forms of angels, sceptred, and robed to the feet, and leaning to each other across the squares, and figures indistinct among the gleaming of the golden ground through the leaves beside them, interrupted and dim, like the morning light as it faded back among the branches of Eden, when first its gates were angel-guarded long ago. And round the walls of the arches there are set pillars of variegated stones, Jasper, and porphyry, and deep-green serpentine spotted with flakes of snow, and marbles that half refuse and half yield to the sunshine, Cleopatra-like, 'thine bluest veins to kiss'—the shadow, as it steals back from them, revealing line after line of azure undulation, as a receding tide leaves the waved sand; their capitals rich with interwoven tracery, rooted knots of herbage, and drifting leaves of acanthus and vine, and mystical signs, all beginning and ending in the cross; and above them, in the broad archivolts, a continuous chain of language and of life—angels, and the signs of heaven, and the labours of men, each in its appointed season upon the earth; and above these, another range of glittering pinnacles, mixed with white arches edged with scarlet flowers—a confusion of delight amidst which the breasts of the Greek horses are seen blazing in their breadth of golden strength, and the St. Mark's Lion, lifted on a blue field covered with stars, until at last, as if in ecstasy, the crests of the arches break into a marble foam, and toss themselves into the blue sky in flames and in the wreath of the tured spray, as if the breakers on the Lido shore had been frost-bound before they fell, and the sea-nymphs had inlaid them with coral and amethyst.

"Between that grim cathedral of England and this, what an interval! There is a type of it in the very childhood that haunt them; for, instead of the restless, horse-voiced and sable-winged, drifting on the bleak upper air, the St. Mark's porches are full of doves, that nestle among the marble foliage, and mingle the soft iridescence of their living plumes, changing at every motion, with the tints, hardly less lovely, that have stood unchanged for seven hundred years.

"And what effect has this splendour on those who pass beneath it? You may walk from sunrise to sunset, and to and fro, before the gateway of St. Mark's, and you will not see an eye lifted to it, nor a countenance brightened by it. Priest and layman, soldier and civilian, rich and poor, pass by it alike regardlessly. Up to the very recesses of the porches, the meanest tradesmen of the city push their counters; nay, the foundations of its pillars are themselves the seats—of them that sell doves for sacrifice, but of the vendors of toys and caricatures. Round the whole square in front of the church there is almost a continuous line of cafes, where the idle Venetians of the middle classes lounge, and read empty journals; in its centre the Austrian bands play during the time of vespers, their martial music jarring with the wailing notes—the march drowning the misere, and the sullen crowd thickening round them,—a crowd, which, if it had its will, would stiletto every soldier that pipes to it. And in the recesses of the porches, all day long, knots of men of the lowest classes, unemployed and listless, lie basking in the sun like lizards, and unregarded—every heavy glance of their young eyes full of desperation and stony depravity, and their throats hoarse with cursing—gamble, and fight, and snarl, and sleep, hour after hour, clashing their bruised centesimi upon the marble ledges of the church porch. And the images of Christ and his angels look down upon it continually."

There is a completeness about the wonderful façade of St. Mark's that we have never met with elsewhere. We have seen buildings that pleased either by their general effect, their proportion, ornament, or colour, but seldom by the union of several at the same time; their authors seem to

have rested content with one source of beauty. But in this instance art seems to have displayed all her attributes, and we have received at her hands a building that meets perfectly those high expectations formed by imagination in general, only to be disappointed. In general composition, it is regular enough to satisfy the most fastidious stickler for symmetry, but here the analogy between it and the buildings of the Renaissance, raised by rule, ends. In the latter, after having studied the arrangement and proportion of the design, and having elaborated a single specimen of each class of detail, we have done our task, knowing full well that one feature repeats another, not only in bulk and general character, but actually as to the minutest particular, or a grievous fault, according to the principles of the style, would be committed. Having studied any one compartment we can feel sure there is nothing more to discover. But with St. Mark's it is far otherwise, it is as a glorious picture not easily to be comprehended; we have sat hour after hour, for days in succession, studying its varied points, finding new features in its ornaments, new harmonies in its colours, until they verily seemed endless. It is the inexhaustibility of subject contained in this façade which we believe creates the great interest felt by the few who have really applied themselves with care to its examination. It has been well said, "that it would be impossible to convey any idea of the building by drawings," it would be equally a task of supererogation to attempt a description after that given by our author, but there are one or two features in Venetian architecture which have been but slightly touched upon by him, such as the beautiful arrangement of angle windows found in many of the Gothic palaces, which open on either front, the angle itself being supported by a column, while a picturesque balcony projects in front; this feature gives great character to the angle, which requires some decoration to prevent its appearing poor; the beautiful roll moulding, however common in this city, serves the same purpose far better than its parody, the quoins of the Renaissance period.

A singularly beautiful string moulding, occurring at the division of the stones, is also worthy of notice: this is in section concave, having the surface carved with sharp and piquant acanthus leaves in low relief, with dark eyes, formed by darkly-drilled holes; the top of the leaves projects considerably, curling over, and coming into full light; thus the string itself is in half tint, while the light-bearing leaves throw long streams of shadow down the vale it preserves and adorns. Mr. Ruskin dwells ably upon the principle of relying for effect on the forms of the dark piercings and the incrustation in the Gothic architecture of Venice, in contradistinction to that of depending upon its lines, observable in the contemporary Gothic of Northern Europe. In the course of his inquiry into the principles that guided the builders of St. Mark's, he enumerated seven rules: of these, the fourth seems to us singularly at variance with his own former writings. To argue for and against the same thing is, however, rather a characteristic of our otherwise admirable author—an eccentricity which we readily pardon.

Every opinion of Mr. Ruskin's is sincerely and earnestly expressed, and his subjects receive such devoted attention at his hands, that every work of his must ever be both interesting and valuable.

Why was Venice chosen throughout as the exemplar of Gothic, whilst other cities of Italy are comparatively unnoticed? Because of the superiority in point of colour, and the chronological series of buildings being more complete, and their history better known.

ICHNOLOGY OF ANNANDALE.—The few remains, or traces of remains, that we possess of the new red sandstone, and the numerous species of animals which are proved by their footmarks to have travelled over its surface at a period previous to its consolidation, render it desirable to supply the geologist with illustrative plates of these interesting objects. These illustrations consist of thirteen plates from the "impressions on the sandstone," of the same size as the original slabs. They are printed in colours, so as to represent the precise appearance of the stone as nearly as possible, and are accompanied with descriptive and explanatory observations. We are informed these admirable lithographs are expressly executed for Sir William Jardine's work, by W. H. Lizars, of Edinburgh.

The Arts.

KARNAK.

ABOUT 4,000 years ago, more or less—for a century or two is of no account in Egyptian matters such as we have to tell of—in the fertile valley of the Nile, and not very far from the sacred Eden, the "Ariah Varta," where, as the sacred traditions and the ethnologists tell us, the first seeds of our race fell from heaven, there was collected a great people in a magnificent city. They were the masters of the then world, and the teachers of everything. It may startle some of us to find from the undoubted evidence of the things themselves, which anyone can see now in the British Museum, that these people lived in a state of high culture and refinement, and enjoyed as much luxury as we do. They had their manufactures of linen and glass and paper; they painted pictures of their favourite cows, and horses and hunting scenes, and their own portraits; they played the harp, and cultivated music and dancing; and at their evening parties the "slow coaches"



could always be set down to a game of draughts, a favourite pastime of Remeses III., and Psamaticus II. And they went considerably beyond our dunkey system, by employing monkeys to hold the candles and hand the fruit about.* They worked in cabinet-work, and made famous chariots and harness, and jewellery, with many ornaments, and superb wigs. Indeed, with the allowance of a few customs which to us seem strange, such as the performances of lady-tumblers, and veneration for black beetles, those Eastern ancestors of ours seem to have lived much such a life as ourselves.

But when we look at their architecture, how we must hide our diminished heads. What have we to compare with their pyramids and their sphynx, their Memnon statues, and this Thebes, with its hundred wonders; in grandeur of design, in complete suitability of purpose, in stupendous innate power and vitality? Where will our St. Paul's and Windsor Castle be 3,000 years hence?

Thebes (Poet., *Θήβη*; afterwards called *Δαΐσπολις μεγάλη*, "the great city of Jove;" in Scripture, No or No AMMON) was the capital of Upper Egypt, or Thebais, and for a long time of the whole country, reputed to be the oldest city in the world, and stood in the centre of Upper Egypt, occupying both banks of the Nile above Coptos, and in the Nomos Coptites. It is said to have been founded by Ethiopians; but this is of course only a form of the tradition which represents the civilization of Upper Egypt as having come down the Nile. Others ascribed its foundation to Osiris, who named it after his mother, and others to Busiris. It was the chief seat of the worship of Ammon, and reached its greatest splendour about B.C. 1,600. Its extent then was probably about fourteen geographical miles in circuit; in Strabo's time, when greatly declined, it still had a circuit of eight miles. The existing ruins extend from side to side of the valley of the Nile six miles, the rocks on each side being hollowed to be used as tombs.

It is most probable that the great buildings were all erected before the Persian invasion, when Thebes was burnt by Cambyse.

Amongst its chief buildings was the Memnonium, a temple of Ammon, with two colossi in front; added to this was one of the three colleges of priests and the burial-places of the kings.

When we speak of Thebes, now, we mean several remains of magnificent temples that have each a name given to it by the Arabs; there is Kourne, Medenot Habou, Dayr el Medeenah, Beni Hassan, Luxor, and Karnak. The ruins of the last are the most ancient, splendid, and wonderful in the world. They are the work of several monarchs, of boundless wealth and ambition, each having done all he could to surpass the efforts of his brother king, and distinguish his own name above all. In this they were not always quite friendly, for they often chipped off the family coats of arms of others, and put in

their own; and some of the columns at Karnak are still defaced in this way. The extent of these ruins is stated by Sir Gardiner Wilkinson to be 1,180 feet, so that the old account of Diodorus saying that the most ancient of the four temples measured thirteen stadia (about $\frac{1}{3}$ English miles) is correct.

The approach to this grand centre of the city was by four principal avenues of colossal animals, fifteen feet long—one of sphinxes, one of lions, another of rams, and one of lions with hawks' heads. The remains of these superb streets are still seen, and some of the statues are in our British Museum. The doors of the temples were guarded by two colossal human figures of the kings or deities; and some idea of their size may be given by that of the lintel stones, some of which, single blocks, measure 40 feet 10 inches in length.

The grand hall of 134 columns, the one side of which is represented in our engraving as it

is now reproduced at the Crystal Palace. It measures 170 feet by 329. The massive roof is supported by a central double row of twelve immense columns, sixty-six feet high, without the pedestal and abacus, and 12 feet in diameter; on either side of these are 122 smaller columns, 41 feet 9 inches high and 9 feet 2 inches diameter, arranged in seven lines. The walls are 25 feet thick. The height of the hall, from the pavement to the summit of the roof, is 80 feet. Every part of this immense structure is covered with figures sculptured in relief and painted most brilliantly, principally descriptive of the wars and conquests of Rhameses† the Great.

The part chosen for reproduction at the palace is from the smaller colonnades, and the proportion is about one-third; the forms and colours having, of course, been precisely imitated.

The foreground in our drawing is in the style of the grotto or tomb called Beni Hassan, the ruins of which still exist, though they are as ancient certainly as the time of the Joseph of Scripture and the Israelite bondage and Osirtasen I., 1740 B.C., and, perhaps, still older, for the hieroglyphic records of Egypt carry us back to the time of the founding of Memphis, 2,320 B.C.‡

The columns here are polygonal, with sixteen faces of 8 inches each, slightly hollowed to the depth of half an inch. They are 16 feet 8½ inches high, and 3 feet 4 inches diameter. The roof is cut in a segment of a circle.§ The walls are painted in imitation of granite. The resemblance to the early Greek is seen in these columns, and,

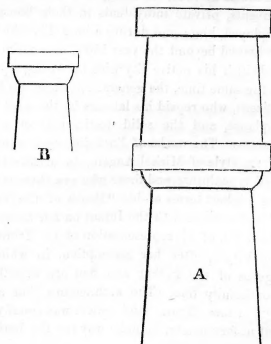
* Monkeys were taught to gather the fruit, as seen now on the walls of Beni Hassan. And in Abyssinia they are made to hold torches at parties, a very ancient custom, as it is said.

† There were once fourteen separate columns; two have been built into the front towers.

‡ Spelt also Rameses and Remeses, *alias* Sesostris.

§ Assyria was founded by Nimrod 2,204 B.C. Nineveh, too, had its splendid hall of 100 columns, and several smaller ones.

The palace of Xerxes had also one of 36 columns. § It is thought by Sir G. Wilkinson that the arch was known at that time.



as our diagram shows, modern architects have invented a theory of the origin of the Doric style from a combination of the round and the polygonal columns.* The form of the columns is well seen in the engraving; it is conjectured to be derived from that of the papyrus, or of the lotus plant, the stalk, and flower of which in various degrees of expansion, from the mere bud to the full-blown blossom it resembles. The largest columns are like the full flower, and almost bell-shaped.

The columns are of stone, and some of granite, coated with a layer of stucco or thick paint. They are covered with sculptures in relief, and painted in bright colours of the purest red, blue, green, and yellow. The oldest reliefs are those called low relief, or a little raised from the surface, flattened, and the edges softened off. The other kind of carved work is a kind of intaglio introduced by Remeses II., and the same as that which has been so admirably imitated in the Egyptian courts of the Crystal Palace. The outline is cut into the slab perpendicularly, and then the part enclosed is cut away in a manner to show the roundness of the forms intended to be drawn, the most prominent parts being left on a level with the surface of the slab. The effect of this mode is surprisingly good, the objects come out quite sharp and with distinct shadow, in their natural form. The ancient colouring was done with powder colours mixed with water and a little gum. The colours used, which were chiefly red, blue, and green, are now known by analysis to be as follows: the reds and yellows, the common ochres; the greens and blues, prepared from copper; the white, common chalk or lime mixed with powdered glass; the black, lamp-black. They seem to have understood the harmony or balancing of colours, and the general effect of such intensely pure colours is wonderfully rich and striking, but they took care always to place a little yellow near a black, and a green near the red and blue.

The colouring of the colonnade, which our drawing shows, is now nearly finished; unfortunately no words of ours could describe its magical and characteristic effect. Almost every spot is painted either with hieroglyphics of the kings' names and titles, or with figures of their deities; those so prominent on the columns are the God Ammon, who is bright cobalt blue, heaven-colour, and his wife, who wears a red dress, covered with a little hexagon pattern in blue; other figures show the red flesh colour with a thin transparent dress over it. The upright stripes are red and blue; the cross ones are some of them bright emerald; but all relieved by the light salmon coloured-stripes. The ceiling at the sides is blue, with gold stars in relief; in the centre it has a series of spread eagles with black and red wings on a blue ground. But all this must be seen to be admired and enjoyed.

A visit to the colonnade at Sydenham, with the aid of the account which we have culled, will be enough to show that the Egyptians created a style of architecture unequalled in originality and grandeur. They carried it out in such solid magnificence and eternal durability that has done, and will continue to do, all that the highest ambition of their heroes desired and aspired to, when our monuments will be meted with the dust; unless, indeed, we should contemplate a Thebes of our own, at the bare thought of which "the boldest heart would be appalled by the incalculable labour and difficulties of such a work." Still, that we should have made to live again a language silent and dead for four thousand years, is a miracle of learning. And here too we possess a unique wonder of our own in this reproduction by Owen Jones and Joseph Bonomi, of such an ancient marvel of ages, in all its perfection, and with a thorough understanding of its meaning.

* The diagram on the preceding page shows this. The lower cross lines marks how the bringing down of the abacus would then form the Doric column, B.

ANCIENT IRISH ARCHITECTURE.—Lord Talbot informed the Archaeological Institute at their last meeting (Jan. 6th) that he had presented to the Crystal Palace the casts of the sculptured crosses which had excited so much attention in the Dublin Exhibition, the east of the great sculptured arch of Tuam Cathedral, the very curious circular windows of Italian King's Co., attributed to the 8th century and other characteristic examples of architectural decoration. The noble president also spoke of the great success that attended the Archaeological Court in the Dublin Crystal Palace.

Portfolio.

OLD FRENCH ARTISTS.

BACHELIER.

THERE are few among the sons of art whose merits have been less generally known in England, and, I might almost add, till of late years so little appreciated in their own country, as the great French sculptors of the sixteenth century. It is true, we often hear the names of Jean Cousin, Jean de Bologne, and Jean Gougeon; but beyond these, few others are mentioned, while some remain almost unknown. The very sources whence they derived their skill, and the French school, after the revival of arts, took its rise, have been misrepresented. Thus we find it constantly asserted in French works on art, and repeated in those of this country, that Leonardo da Vinci's arrival in France was the signal for the use in that country of her best artists; and Jean Cousin is placed at their head as the first who rivalled the great Italian masters. It was, however, not by the lessons of Leonardo, but those of his great rival Michel Angelo, that the first Frenchman who rendered the new style popular in France profited so much, and trod so firmly in the footsteps of his master. Jean Cousin was preceded by Nicolas Bachelier of Toulouse, the novelty of whose claims to this distinction, in the eyes of your English readers, will, I trust, prove my best excuse for troubling you with this notice. Leonardo da Vinci arrived in France at the end of the year 1515, and died in 1519. His writings were not translated into French until long afterwards by Freart de Chambray; his lessons could not, therefore, in 1519, have had the influence upon the French school which has been attributed to them. Jean Cousin was, indeed, at the period when Leonardo died, at the utmost only twenty years of age. Nicolas Bachelier, on the other hand, was the son of an artist, whose family came originally from Lucca, but had been long established at Toulouse, and was born about 1485. After receiving his early education as an artist from his father, he travelled into Italy, and became a pupil of Buonarroti, under whose guidance he worked for some years with so much success, that, upon his return to Toulouse in 1510, he effected a complete revolution in art in that city, then the capital of Languedoc, and a place of great importance. Previous to Bachelier's arrival there, it appears that his father and some other artists, painters and sculptors who resided at Toulouse, had endeavoured to introduce some innovations in the composition and execution of their works, but their efforts had been in vain. The gothic style had still too many partisans among their fellow-citizens, and it was only after the return of the young Nicolas Bachelier in the above year, that, struck with admiration at the very first work he produced, those who controlled the public works at Toulouse admitted the beauties of what was to them a new style in art. His triumph was, however, complete; the various public bodies in the city vied one with the other in giving encouragement to the efforts of the young architect and sculptor. The magistrates at the Hôtel de Ville, the clergy in the churches and convents, private individuals in their houses, all employed him; and during a long life, which was prolonged beyond the year 1566, he continued to embellish his native city with his works, enjoying, at the same time, the general esteem of his fellow-citizens, who repaid his labours by the most lavish applause, and the solid testimonial of a large fortune. The works of Bachelier were altogether in the style of Michel Angelo, in architecture as well as sculpture, and those who saw them speak in the highest terms of his "Death of the Virgin," also of a statue with the Infant on her knees; but above all, of his representation of the Trinity and the Virgin, after her assumption, in which the figures of the Father and Son are described as wonderfully fine. The architecture that accompanied these figures and reliefs was equally good but unfortunately, to make way for the barbarous

ornaments which now replace them, these specimens of Bachelier's talents were ruthlessly destroyed in Louis the Fifteenth's time, a period when bad taste was as fatal to some of the finest works of art in France as all the excesses of the great revolution. Enough, however, of Bachelier's works still remain at Toulouse to prove his great talents, and well deserve to attract more notice than they have done for many years. They consist of colossal Terminals, reliefs, busts, grotesques, &c., and should undoubtedly be placed chronologically before those of Jean Cousin in forming a series of the works of French artists since the Renaissance; a position which I would express a hope we may some day see them occupy in the great universal home of art at Sydenham. It was long supposed that Nicolas Bachelier had two brothers, a sculptor, and another who executed ornamental metal work, but this is now proved not to have been the case. He, however, left a son, Dominique Bachelier, who was also an architect and sculptor, and who, in conjunction with Souffron, completed the old bridge at Toulouse, which had been begun by his father. I shall conclude by mentioning the very singular fate of Bachelier's own bust, by Marc Arctis, that had been placed in the "Galerie des Illustres" at Toulouse; and which, being mistaken by the mob in 1789 for that of William Tell, was seized upon and paraded for several days through the streets at Toulouse as that of the great hero of liberty.

RAOUL.

UNCLE DAVID'S WANDERINGS.

No. V.—ROME.

"Imperial mistress of a conquered world,
Nearest destruction at herself she hurried;
Now, the sole index of the Roman name
Is Tiber, still in motion, still the same."

ARRIVING at the Dogana, or Custom-house of the Roman frontier, and presenting our passports (for in Italy you cannot move a mile without this absurd appendage), our trunks were examined with unusual ceremony—especially those containing English publications—Lady Morgan having incurred the Pope's displeasure about this time, in publishing some unsavoury remarks about the early life of his Holiness, which were smuggled into Rome, we were told, under the disguise of "Blair's Sermons," but the hoax being soon afterwards discovered, every scrap of English print was forthwith carefully scrutinized; but although the trunks alluded to were carefully corded and sealed with the signet of Pope Leo the Twelfth, a small silver coin was sufficient next day to induce the officials in Rome to overlook every volume in our possession. Deprived as we were for a while of our favourite authors, we contrived to pass the time pleasantly enough in mutually exchanging Scotch or English phrases for those of Italian in *lingua Toscana*, with two lively [young ladies] of our party, who seemed to enjoy the fun exceedingly.

At length, after many an anxious look out, we descried the majestic dome of St. Peter's, distant about seven miles, the identical spot chosen by Sir Charles Eastlake the same year (1826) for his famous picture entitled, "The Pilgrims' first sight of Rome," which portrays to the life the pious demeanour of that class of Italian peasantry, and which, to our fancy, is the finest and most talented production the public has yet been favoured with from the pencil of Sir Charles—whose elevation to the presidency of the Royal Academy is chiefly to be attributed to the genius displayed in the picture here alluded to. Some two hours afterwards (our horses, like ourselves, being wearied of their week's journey), we entered Rome with joyous hearts, through the Porta del Popolo, the grand entrance from the north. Here, our passports were delivered up to the care of the authorities during the sojourn of each passenger in the "eternal city," and passing along a variety of streets of little interest, we terminated our journey at the Custom-house (an edifice of no ordinary beauty and magnitude), and after a general exchange of good wishes with our fellow-travellers, and presenting our steady, attentive coachman with an extra fee for his attention, we were soon comfortably lodged

in the same neighbourhood. Greatly refreshed with an uninterrupted night's sleep, we sallied forth in quest of St. Peter's, which we soon found after crossing the Tiber by the stately bridge of St. Angelo, which, with the castles so named, are the lions of this ancient portion of the city. A little further on, the exterior of St. Peter's is seen to perfection, and greatly we were delighted on reaching the noble piazza that lies outspread before this gorgeous masterpiece of architecture. The magnificence of the structure I must not attempt to describe, but this has recently been done by a masterly hand (the gifted author of "Athens: its grandeur and decay"), from which take the following extract, and be satisfied—for a good copy is better than a bad original:—

"After the deaths of several architects and popes," says the author just alluded to, "Pope Paul the Third, on ascending the Papal chair, committed the entire management of the edifice to Michael Angelo, then seventy-two years of age. That eminently-gifted and venerable man undertook the work with great reluctance, refusing, on its accomplishment, all remuneration. The extraordinary energy he displayed, and which he also infused into others, excited many to become his enemies; and so incessant were the annoyances of underlings, that his devotion to the object alone prevented the resignation of his service. His genius planned numerous alterations and improvements of the building, but he did not live till it was finished, though he carried the dome, according to his own design, to its present height. The edifice was undertaken after his decease by Giacomo della Porta, during the pontificate of Gregory the Thirteenth, who was so anxious to see it finished, that six hundred workmen were employed at it night and day, and 100,000 golden crowns were annually voted for its erection. Carlo Maderno, another architect, completed the body of the church. One hundred and seventy years elapsed before this was done, and three centuries were required to bring the structure to its present form, its progress extending over the reigns of no fewer than forty-three popes. In the middle of the sixteenth century, Carlo Fontana drew up a statement of the sums of money that had been expended on the building of St. Peter's, principally from the value of materials; the total amounting to £11,625,000 of our money. The circular colonnade, consisting of four rows of columns, in number 256, which stands in front of the cathedral, was designed by Bernini, and is considered his masterpiece. Its beauty and grandeur increase when viewed apart from St. Peter's, with which it does not harmonize, but it is admirably adapted to conceal the ignoble buildings surrounding it. On the entablature of these columns are 192 statues of departed saints, each eleven feet high. A beautiful Egyptian obelisk, which once adorned the centre of Nero's circus, was removed by one of the architects of St. Peter's to its magnificent colonnade—the height of which, in one solid block of finely-wrought granite, exclusive of the basement, is upwards of sixty feet. This part of the edifice was further beautified by two fountains, the structure of each consisting of an immense basin, nearly thirty feet in diameter at the level of the pavement, with a stem springing out of the centre, supporting two diminishing granite basins, at different heights, and rising, in all, to an elevation of more than fifty feet. From the summit of each of these stems gushes and sparkles a torrent of water, the central jets of which rise nearly seventy feet from the pavement in perpendicular height; thence the water falls like a triple cataract—first, from the summit of the jets into the upper, which is the smallest, vase or basin; then, passing over the rim of the upper basin in an enlarged column, it descends into the second basin, from which, in still greater volume, it pours into the lowest—the largest basin of the three—thus producing the beautiful effect of a cone of falling water. The effect is exceedingly striking and beautiful; and, unlike the water-works of Versailles, which only act on grand occasions, their flow continues undiminished and perpetual. Under thirteen colossal statues, seventeen feet high, representing our Saviour with his twelve apostles, are five open entrances leading into the

magnificent vestibule, which extends the whole width of the front, and beyond it at either end. The length of the interior of St. Peter's is 609 feet from wall to wall.* The width of the nave is 91 feet, and its height to the top of the vault is 152 feet. The length of the transepts is 444 feet. The central nave is universally regarded as surpassingly grand and sublime. Eighty-nine feet in breadth, and 152 feet high, it is flanked on either side by a noble arcade—the piers of which are decorated with niches containing statues of eminent men. A semi-circular vault, highly enriched with sunken panels, sculptures, and various gilded ornaments, is thrown across from one side to the other, producing the most splendid effect. Walking up this magnificent avenue—in itself one of the grandest works of art—the visitor reaches a part of the building incomparably grander still—Michael Angelo's Cupola, which is raised over the centre of the plan. The effect of its illumination when seen from without baffles description, but the interior is never seen to so great advantage as when, on the evening of Good Friday, it is lighted solely by an immense score of lamps suspended in the centre, under the dome. These lamps shed a liquid brilliancy on the vast space; while a pale and uncertain light, diminishing in proportion to its distance from the focus of the cross, fills the rest of the edifice, veiling, but revealing with wonderful effect, the colossal statues on the tombs, and the crowds of human beings there assembled, shrunk into pigmies. The idea of this illumination is ascribed to Michael Angelo, and while it continues, the stately columns seem to swell in size, the roofs and the dome to attain an unusual elevation, and the vast dimension of the whole edifice to become still more colossal. Immediately under the dome stands the baldacchino, or canopy, which covers the high altar, beneath which tradition says that the body of St. Peter reposes. The canopy is 122 feet high, and constructed almost entirely of bronze, and the ornaments are chiefly gilt. Its immense size awakens much admiration.

"One is astonished," says another eloquent writer, "to find so much splendour united with such an air of repose, of majesty, and of quiet. There is a serenity of look, and an equability of temperature in this vast edifice, which throw over all its parts an inexpressible charm."

From St. Peter's we passed through the northern entrance to the Pope's palace of the Vatican, which is of great magnitude, and contains, it is said, upwards of 4,400 apartments, with 20 courts, 8 grand, and 200 small, staircases. It also contains two splendid chapels, the principal of which is the Sistine chapel, and here we beheld the amazing fresco painted by Michael Angelo, representing the Last Judgment, in which, it may be said, "terror and grandeur join in the extreme," and though three centuries have passed since it was completed, the picture is not so much the worse for its age as might be expected, considering the action of damp with the smoke of incense it is continually exposed to. When this mighty artist had completed his design for the gigantic undertaking, he received a letter from his friend Arétino the poet, of which the following is an extract:—"Who would not be dismayed in applying his pencil to such a terrible subject? I see the terror in the countenances of the living; I see the symptoms of extinction in the sun, the moon, and the stars. I see fire, and air, and earth, and water, as it were, yielding up their spirit. I see Nature at a distance, confounded—concentrating her barrenness in the decrepitude of age. I see Time dried up and trembling, who, being come to his utmost limit, is seated on a withered trunk. And while I perceive the hearts in every breast agitated by the trumpets of the angels, I see Life and Death overwhelmed by the horrible confusion. I see Hope and Despair conducting the ranks of the good and the crowds of the wicked."

It is in the Sistine chapel that the cardinals meet in conclave on the death of a pope, to elect his successor. While thus assembled they are locked up, and cannot leave until their choice is made. Many of the noble apartments of the palace are crowded with rare and most valuable works of art in painting and sculpture, to enu-

merate which would fill a series of volumes of prodigious dimensions. Here, it may be added, is placed that elaborate group of the Laocoon and his sons, which is considered the most sublime work of art in the world, together with the Apollo Belvedere, which are universally allowed to be the principal objects of attraction in the palace of the Vatican, and alone worth going a thousand miles to see.

Yours respectfully,
Sydenham, December 20, 1853. U. D. D.

Correspondence.

To the Editor of the Crystal Palace Gazette.

SIR,—You evidently favour this detestable beard movement. I can't conceive what there can be to admire in such a shaggy appendage. When I was on the continent the daily sight of so many dirty people, with great, red, and sandy beards, made me quite ill. At Frankfurt especially I sometimes came suddenly upon creatures as terrific as the red-fingered demon who does the cloak business in "Der Freischütz," or Bertram in "Roberto il Diavolo." I hastened home with a shudder, a complete loss of appetite, and my nights disturbed by monstrous dreams of "Caliban" and the Cyclops. When I landed at Dover, I could have fairly hugged the first clean-shaved Englishman, although he was a custom-house officer, and I knew he'd collar my Mecklin lace or something. Why should you men all try to make yourselves look like "wicked uncles"? I like to see the mouth, that most expressive feature, and the chin; if you allow them to be so covered up with that horrid monstache, ladies will never know when you smile, and I'm sure you'll lose a great deal by this. I'll tell you another thing too: we shall all suspect, that like the Emperor Hadrian, you've got pimples on your chin. It's all an excuse; half the men who wear beards are lazy; the other half do it to make us look at them, because they know they'd never get a look, even of horror, without this singularity; and as to those young monks that smoke and swagger with a military air up and down Regent-street, I put them all down as "*Faux capitaines*" and "*chevaliers d'industrie*."

Then as to your pretence about your health and protecting your chest—bah! buy a hairkin. If beards are so necessary for health, I should like to know what we are to do for beards; ask your doctor that.

I am, Sir, yours disgustfully,
BARBARA.

To the Editor of the Crystal Palace Gazette.

SIR,—I observe that the projected grand organ for the Palace has excited the doubts and awakened the objections of a correspondent of the *Spectator*. He seems to conclude that pipes of such vast magnitude cannot possibly give the deep notes required.

I recollect, many years ago, reading that a pipe put up for one of our cathedral organs would not speak until a smaller tube in unison was placed by its side.

Can any of your musical readers give an account of the curious circumstances of this musical sympathy?

I have the honour to be, Sir,
Yours most obediently,
HARMONICES.

THE PHOTOGRAPHIC EXHIBITION IN SUFFOLK-STREET, PALL MALL.

This exhibition deserves warm encouragement. Those who have not carefully watched the progress of the art of painting nature by the sunbeam will be startled at the rapid improvement which has been made within a few short months. Photography has gained in breadth, depth, length, and height. Its outlines are becoming daily sharper and more striking. It is learning to convey an adequate idea of the massive in nature and art. The sombre architecture of Spain, the majestic cathedrals of France, Germany, and England, are represented. The remote and unvisited scenery of the Pyrenees may almost be realized. The ancient crosses, &c., of Ireland are here given, so that a decent Gothic mason might reproduce them. The magnified representation of a fly's tongue is stereotyped. Animals, too, are pictured to the life. It is in the likeness and miniature department, however, that photography shows its strength and its weakness. Some of the types of humanity sporting in sunbeams might have been spared; but many are most exquisitely happy in their element. One especially courts our attention, a striking hit of Mr. Bodkin, the celebrated barrister, smiling as we may see him smile after having successfully carried his verdict against an unlucky swindler. It is clear that the sun of art has not yet set.

QUERIES.

What is the origin of the term "Sarcophagus"?

Have any geological specimens been found in the excavations for the Palace?

Has any one written a systematic work on Ancient Ethnology?

Musicum Opus of the ancients—how many varieties?

* That of St. Paul's, London, 521 feet.

Miscellaneous.

NORTH AUSTRALIAN.

THE above Engraving was taken from a drawing of a North Australian, by Piericini, jun., a rising young artist. He has a casting-stick in his hand, which he is about to throw at some object, whilst his unkempt hair is standing out from his head like so many snakes; and his spare figure affords no very pleasurable sensation as to the manly development of beauty of form in these tribes; but there is something very characteristic in his countenance. It is surprising to us who are accustomed to comparative perfection in accoutrements and weapons, with what skill and address these North Australians use this casting stick. We have seen a native Australian cut a stick from a tree with all its deviations and curves out of a straight line about twelve feet long; a hard piece of wood is then affixed at one end with rushes bound round, to keep it firm; it is then pointed as sharp as a needle. When it is darted at anything by the native, who always holds it exactly in the same way, it rises up in the air, and seems to be travelling any way but to the object intended, nevertheless, they



will hit the mark, whatever it may be, twice out of three times in the centre, at a distance of sixty feet in advance.

CHASOE.

Téigne soy d'amir qui pourra,
Plus ne m'en pourroie tenir;
Amoureux me faut décevoir.
Je ne sçay qu'il m'en adendra.
Combien que j'ay oy de pica
Qu'en amours fait maints maux souffrir
Téigne soy d'amir qui pourra,
Plus ne m'en pourroie tenir.

Mon cœur devant hier acrointa
Beaute qui tant la sçet cheir
Que d'elle ne vait departir;
C'est fait, il est sien et sera:
Téigne soy d'amir qui pourra,
Plus ne m'en pourroie tenir.

SONG.

Let bitter thoughts, that tinge the cheek,
Make others sad, I heed them not,
For though unknown my future lot,
Yet must I still Love's favours seek.
The woes the lover's sight bespeak
Men oft discuss with anger hot;
Let bitter thoughts, that tinge the cheek,
Make others sad, I heed them not.

My heart has known, 'tis not a week,
Fair one who to it did allot
A place so near hers it forgot
Even of liberty to speak.
Let bitter thoughts, that tinge the cheek,
Make others sad, I heed them not.

BERDAN'S QUARTZ CRUSHING MACHINE.

WE have recently spent a morning, much to our satisfaction, in inspecting the performances of this wonderful engine. It is at present set up in an iron foundry near the Eagle Tavern, in the City-road. We found ourselves surrounded by a motley group—scientific inquirers, grey-eyed, sharp-featured share-brokers, bluff Cornish miners, and a few enthusiastic proprietors of valuable dirt or bits of corroded stone. Gossan, killas, quartz, were the burden of the chorus to the rough music of the engine.

But the affair is no joke. We saw dirt go in, and gold come out. It is true that the button was not always large. Sometimes nothing came from an apparently promising sample. Sometimes gold appears in quantities when the experiment is intended as little more than an inexpensive trial of luck—a mere jest at chances. Nobody knows what will turn up next.

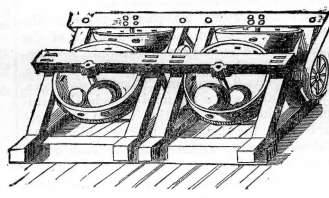
The machine is simple. Two large iron basins, about five feet each in diameter, are made to revolve by steam power. These basins are inclined about fifty degrees. Two balls of cast iron, weighing respectively five and three tons, are kept by gravity in the lower side of each basin. They are loose, and roll over the ore as the basins revolve. A quantity of mercury is first cast into each basin, next a quantity of ore, and then water is suffered to run freely from a pipe to cover the whole, and to wash away the earthy matter. As the basins revolve, the ore is crushed, the water washes the non-aureiferous portion through certain apertures, whilst the mercury seizes on every particle of gold in the ore when reduced to an impalpable powder.

If water power be substituted for that of steam, a very minute proportion of gold per ton would render profitable returns. We are told that many roads in the West are paved with gold, and that gold is scraped up in the thoroughfares. We scarcely dare state what we have heard of the results within the last few days.

We have been told that the principle of the engine is not new. Mills with a grinding ball are (as may be seen in our article on "Crystal and Glass") as old as the Romans. Very likely Noah may have had one in the ark. We generally see such a machine, with a revolving ball, in a gambler's tent at horse-races—and no one ever doubted their gold-producing properties. Taddy grinds, or did grind, snuff, with revolving balls. All this is true; but Mr. Berdan deserves the £200,000 which he is to get for his invention. We have seen a mortar and pestle years ago, which would answer the purpose, but we did not apply the idea—Mr. Berdan is the Columbus who sets the egg on its bottom.

It seems to us that the machine is open to improvements—the little ball grinds on the big one to no purpose. It would be quite as serviceable if kept at a

little distance, by a very simple device. Other points, too, might be mentioned—but we think of getting at least half a million for our notions, therefore we hold our peace. The machine is applicable for other purposes than that of producing gold. But gold, gold, that prince of metals, seizes most strongly on our imagination—and with Mr. Berdan and his rivals we shall yet realize a golden age.



PAINTING AT THE PARTHENON.—The *Athenæum* contains a very able letter about the colouring of bas-reliefs. The writer has entered well into the æsthetic points of the question, but rather avoids the practical facts. We shall take an early opportunity of entering into this interesting question.

THE COLOGNE SINGERS.—It will be remembered that the Cologne singers, who paid a visit to the Crystal Palace last summer, and sang some of their charming choruses, have elected Dr. Samuel Phillips, the literary director of the Crystal Palace, an honorary member of their society. We hear they also intend to revisit England early this season and repeat their beautiful melodies at the Crystal Palace.

THE ARCHÆOLOGICAL INSTITUTE.—The annual visitation is fixed to be held at Cambridge this year.

AN AGED ARTIST.—Ssounowsky, a Russian painter, died lately in Moscow, aged 122 years, 1 month, and 25 days. He painted steadily up to the age of 117. He couldn't complain of the "ars longa vita brevis"—that life was short and art so long.

The Sydenham District Gas Company have just issued their prospectus, and we have no doubt the establishment of this company will be a great boon to the inhabitants and public generally.

MAGNIFICENT ENGLISHMEN.—We all remember the Malachite doors in the Hyde Park Palace, and every one was astonished when it was known Mr. Hope, of Piccadilly, had given £7,000 to possess such a jewelled portal. But the Duke of Hamilton has, we hear, had the unrivalled Ghiberti gates of Florence cast in bronze precisely like the originals, for his family mausoleum, a beautiful work, which will be covered by a solid glass dome, cast in Paris at a large cost, which the Birmingham glassmen declined to do for less than £5,000.

COTTAGE GARDENS.

HOME! how dear does the echo sound! Is there nothing that lends enchantment to the theme? Behold yon lowly cottage, where may be found the favourite rose-tree and the modest snow-drop, or the gaudy crocus. Here we will linger, and if a little information will help the inmate over a difficulty, our object is answered—though to write about cottage flowers at this season of the year—ugh! say some, is downright nonsense—there are no such things.

We would call the attention of the cottager to the state of his favourite plants. Amongst these stand first—bulbs. As the earliest flowers, hyacinths, whether in glasses or pots, ought to receive every attention; those in pots forward by artificial heat, in glasses, and provide with fresh water. When necessary, have guards in readiness for preventing the foliage from falling over the sides—wire is best, as it is neat and durable. Snowdrops and crocuses in pots will also require looking to, water, fresh air, and sunshine, are their chief requisites. In the open ground we hope soon to see them heralding of the approach of spring. Tulips and narcissus in pots—these amply repay a little extra labour bestowed in growing them thus, by the fine colours of the one, and the rich perfume of the other. See that these are regularly supplied with water, and the soil kept free and open at top; this will suffice at present for window bulbs. Many others will, no doubt, receive an anxious look, to ascertain their safety or otherwise; of these will be found the camellia, fuschias, geraniums, and others of our chief window summer ornaments, each requiring a separate article. Of the first, we can only say as they approach blooming, keep clean, sponge, and free from dust: assist in blooming by clear manure; water occasionally; destroy worms; be careful not to over-water. Fuschias—those that have been stowed away to preserve from frost—bring forward and encourage to start. Geraniums, lift into flowering pots, remove small leaves, and be sparing of water after shifting.

Take every advantage of fine weather to forward out-door operations—delays are dangerous—except in removing the protections against severe weather. Dig, hoe, and clean borders—roll walks—sweep lawns, &c., and prepare for planting, &c.

The next lecture at the National School-room (by the kind permission of the Rev. C. English), will be on Thursday next, February 2nd, on the English Constitution, by David Rowland, Esq.

CRYSTAL AND GLASS.

We intend from time to time to bring before our readers portions of the locked-up treasures of the ancients. We shall, of course, confine ourselves to that which is useful—that which casts light on science and art. Strange to say, a classical education is seldom applied to any practical purpose. Thousands of useful facts and hints are lying cemented like fossils in the ancient strata of mental development, yet few think of investigating more than the ancient poets and historians.

We shall commence with an extract from Pliny. We find the text very corrupt, and, therefore, have attempted only to convey the sense in a free version. The visitor to the Crystal Palace ought to know something of the history of glass. All Pliny's stories on this and similar subjects may not be true, but they are seldom wholly improbable.

There is a part of Syria which is called Phœnicia, near Judea, at the foot of Mount Carmel. In it is a marsh which is called Candavia, from which the river Belus is supposed to arise, running into the sea, about five miles from Ptolemais. The Belus runs slowly; the waters are unwholesome, although deemed sacred for religious rites. It is also muddy and deep. The river yields sands only after the tides, for then the filth has been cleansed by the agitation of the waves; the sand quality, also, of the sea-water is believed to conduce to this purification. The extent of the beach is not more than half a mile, and the sand on this alone for many ages was employed for making glass.

Report says that a crew of soda-merchants once landed on this spot. They wished to prepare their food, but not finding stores to support their kettles, they substituted lumps of soda from their ship. These became heated, and, mingling with the sands of the beach, clear streams of the noble fluid issued forth; and this was the origin of glass. Soon after, the acute and ingenious mind of man was not content to have mixed soda only, the *magnet** also began to be added, since it is believed to attract fluid glass as well as iron. In like manner, bright pebbles began to be fused, then shells, and inland or dry sands. There are those who assert that fragments of rock crystal are used in India, and that for this reason no glass is to be compared to the Indian.

The material is fused with light and dry wood, Cyprian copper and soda (especially Oxydum) being added. This is accomplished in kilns or furnaces constantly supplied with fuel until the copper is melted, and a blackish mass is formed.

From these masses it is remelted in the manufactories, and is then stained. One vessel is shaped by blowing, another by the wheel, and a third by the lathe, by the graver. Sidon was once renowned for these manufactories, and her artists had invented even glass mirrors. Such is the ancient manufacture of glass.

In more recent times, a white sand has been found which rises from the Vulturium Sea, and is cast up mid-way between Cumæ and the Lucrine Lake. It is very soft, and is ground by a ball in a mill. It is then mixed with the purest of soda by weight or measure (?) and having been melted it is poured out into other furnaces. Then it becomes a mass which is called *Hammonitum*. It is re-melted, and becomes pure glass—a mass of white crystal. Sands are now melted in the same manner in the provinces of Gaul and of Spain.

They say that, in the reign of Tiberias, a composition of glass was invented which was flexible, and that the whole manufacture of the artist was destroyed, lest the value of bronze, silver, and gold, should be deteriorated. This report was for a long time widely circulated, rather than authentic. But it is of importance that, in the reign of Nero, the skill of an artist could render the glass class (which they call *perotos*), with handles, worth 6,000 sesterces—(about £50 of English money.)

Works in obsidian are classed with those of glass. They are named after a stone, of very black colour, found in Ethiopia by Obsidius. Sometimes it is transparent, then more clear, and reflects images when fixed up as a looking-glass on the wall. Many artists manufacture gems of it. We have seen also solid images of Augustus wrought in this dense material, and he himself dedicated four elephants of obsidian as a wonder in the temple of Concord. Tiberius Caesar sent back for the ceremonies of Heliopolis, an obsidian image of Minerva, which had been found there amongst the property left by one who had governed Egypt. From this circumstance the use of this material appears to have been rather ancient, although now supplanted by glass. Xenocrates states that obsidian is found in India, in Samium, a province of Italy, and near the ocean, in Spain.

Obsidian glass is made by a kind of color ring. It is used for eating vessels, and the body of the glass being red and not transparent it is called *Hammonitum*. It is manufactured also white, and like the myrrh stone, the amethyst, and the sapphire; nor is there any material more easy to work, or more fit even for painting. The greatest honour, however, is assigned to that which is perfectly white and colourless,—that which is nearest to clear rock crystal.

Its utility for drinking vessels has expelled gold and

silver plate. It cannot endure heat. Crystal globes filled with water, when the sun is opposite, excite so great heat that they set garments on fire. Fragments by heat are united so firmly that they cannot be disjoined, except by fracture. Tiles are thus made which some call *abaculi*, which are variegated in many ways. Glass melted up with sulphur fuses into a stone.

It will be at once evident from the above statements that the ancients had made very considerable advances in the manufacture of glass. We are not aware that pure crystal is crushed by modern artists to obtain clear material. The colours of ancient glass appear to have been produced by the mixture of native mineral earths; modern colours are produced by oxides, &c., supplied by the manufacturing chemist.

Obsidian, or volcanic glass, is found in many parts of the world. It is generally black, or dark brown, but we have a specimen which is green. In Mexico it is abundant, and was formerly used for knives as well as mirrors. In that country a variety is found which reflects a chatoyant light. Another variety, from the Bay of Islands in New Zealand, bursts with a loud explosion when cut by the lapidary's wheel.

It appears to us that native minerals are too much neglected in the present day. If the ancients could do so much with a few varieties of native earths, oxides, &c., surely we might achieve more with the refined applications of modern science. Nature leads the way from obsidian to glass. Beautiful specimens of nature's colouring are everywhere to be seen in mineralogical cabinets. Instead of being cherished as a mere matter of vertu, toys of conventional taste, they should furnish serious study to those whose interests or tastes, may lead them to investigate the important questions involved in the manufacture of beautiful and permanent colours, pigments, or enamel.

THE NEW CRYSTAL PALACE.—A lecture on the building at Sydenham was given at the London Mechanics' Institution, by Mr. Edward Hall, F.S.A. The subject was illustrated by large plans, and by a collection of beautiful photographs, by Mr. Delamotte, showing the various stages of progress. It was argued that the influence of such a remarkable display of the works of nature and art would greatly aid in national education, as well as elevate the standard of morals, by supplying, in place of inducements to low vices, other worthier amusements, to meet the necessity of some relaxation or other as a natural desire. The lecturer therefore thought the project of the Crystal Palace Company had an importance in regard to the advancement of society which removed it far from the level of ordinary speculation; and it was mainly with such noble views that he really believed it was being so successfully carried out.

TO CORRESPONDENTS.

Books on science and art in ancient as well as modern languages, may be sent for review to 54, Paternoster-row, addressed to the Editor.

Specimens of Photography, new designs, and modern inventions, will be noticed if they have merit, and proper explanations, where needful, be furnished.

Some of our correspondents are extremely desirous of favouring us with Notes and Queries, confined to our proper subject matter. We are disposed to assign a portion of our space for brief inquiries and pithy replies.

Advertisements.

NOTICE OF DIVIDEND.

BANK OF DEPOSIT, NATIONAL ASSURANCE AND INVESTMENT ASSOCIATION, 7, St. Martin's-place, Trafalgar-square, London. Established A. 1814.—The Warrants for the Half-yearly Interest, at the rate of 5 per cent. per annum, on the Investment Stock of this Association, to the 31st of December, will be ready for delivery on and after January the 15th, and payable daily between the hours of Eleven and Three o'clock.

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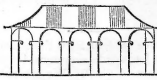
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Assistant at Clark's, Vigo-street, informs those Ladies and Gentlemen whose HAIR has been under his management for some time, that he has commenced business for himself, 45, Old Bond-street, one door from Piccadilly.

G. HUTSON, Carpenter, Builder, and

Under-taker, opposite Ivy-place, Upper Sydenham, Kent. Various Blinds repaired and made to order. Estimates given for Buildings and general repairs.

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24 MR 54

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